

Klamath National Forest Best Management Practices

REGION 5 EVALUATION PROGRAM WATER QUALITY MONITORING REPORT 2005

December 13, 2006

Evaluation of Forest Service administered projects including timber sales, roads, grazing, prescribed fire, recreation sites, and common variety minerals activities.

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**KLAMATH NATIONAL FOREST
2005
BEST MANAGEMENT PRACTICES (BMP)**

SUMMARY

Calendar year 2005 was the fourteenth year of the Best Management Practices Evaluation Program (BMPEP) on the Klamath National Forest and the Forest Service Pacific Southwest Region (Region). This program is designed to evaluate how well the Forest and the Region implement BMPs and how effectively the BMPs control water pollution from National Forest lands. Onsite evaluations have been divided into 28 evaluation categories that reflect related timber, engineering, recreation, grazing, fire, common variety minerals (rock pits) and vegetation management practices. In-channel evaluations, another BMPEP component, is being done at the Regional level, and is not covered in this report.

The Klamath Forest's BMPEP is composed of two sampling strategies. The first is the evaluation of randomly sampled sites, where data are collected and entered into a Regional database. The second strategy is non-random monitoring, in which sites are selected based on management interest in specific ongoing projects. These sites are often sampled concurrently. Concurrent evaluations are "real time" and can be qualitative. Most randomly sampled site evaluations require that 1 to 2 winters have passed prior to completing the field assessment; however, two protocols (snow removal and in-channel construction) require at least one sample per site to be done during the active project phase. The site evaluations followed protocols described in Investigating Water Quality in the Pacific Southwest Region: the Best Management Practice Evaluation Program (BMPEP) User's Guide (USDA, Forest Service, 2002, Forest Service, Vallejo, CA). In cases where the sample pool is very small, either all eligible sites are evaluated, or selection is done in a way that does not bias which sites are selected. The results of the random and non-random program parts are summarized here separately.

Randomly sampled sites: In 2005, 48 sites on 25 projects were randomly drawn from Forest activity pools. Each project or site was reviewed for BMP implementation and effectiveness. Timber (13 sites), road engineering (20 sites), recreation (3 sites), grazing (1 site), common variety rock pits (1 site), vegetation manipulation (4), revegetation of disturbed areas (2), and fire (6 sites) activities were evaluated. Monitored activities were located on Oak Knoll, Happy Camp, Salmon River, Scott River, and Goosenest Districts.

BMP Implementation was evaluated to determine whether: (1) we did what we said we were going to do to protect water quality; and (2) project environmental documentation and/or contract/permit language was sufficient to protect water quality. BMP effectiveness determined if water quality protection measures met objectives. The objective for meeting most evaluation criteria is keeping all sediment out of channels and near-channel areas. Sediment deposition presence, volume and proximity to the nearest watercourse were used to indicate levels of water quality protection.

Table 1 summarizes the results of the **BMP Random Site Evaluation Program for 1992 through 2005**. Sites that partially meet evaluation criteria are not tallied in the "fully successful" group.

Table 1. BMP Random Site Evaluation Program from 1992 through 2005.

Monitoring Years	Total # of Sites Monitored	Sites Meeting BMP Evaluation Criteria			
		Implementation		Effectiveness	
		# of Sites	% of Total Fully Successful	# of Sites	% of Total Fully Successful
1992	53	29	55%	43	81%
1993	77	61	79%	72	94%
1994	52	39	75%	46	89%
1995	77	64	83%	74	96%
1996	57	48	84%	56	98%
1997	60	60	100%	59	98%
1998	61	38	62%	30/35	86%
1999	38	25	66%	34	89%
2000	45	40	89%	43	96%
2001	64	56	88%	61	95%
2002	53	49	92%	47	96%
2003	51	51	80%	45	90%
2004	53	50	94%	53	100%
2005	48	46	96%	47	98%

In 2005, BMPs were fully implemented at 96% of the sites evaluated and effective at 98% of the sites evaluated (water quality was protected at some sites even if BMPs were not fully implemented). This represents status quo in BMP implementation (a 2% increase) and effectiveness (a 2% reduction) compared to 2004.

Non-Randomly sampled sites: Several sites were selected for concurrent monitoring because the activities pose a potentially high risk for sediment discharge. These sites are not included in the numeric summaries in Tables 1 or 2. They are discussed in the Non-Random Site Results Summary section.

The report recommends how to continue improving monitoring results by ensuring implementation and further refining the effectiveness of BMPs.

Appendix 1 is a cross-walk between the BMPEP protocol alpha-numeric identifier and the BMPs it assesses.

BMP MONITORING REPORT

INTRODUCTION

On-site evaluations are the core of the BMP Evaluation Program. There are 30 different evaluation procedures designed to assess a specific practice or set of closely related practices. Though the evaluation criteria vary based on the management activity, the evaluation process is similar. The Regional Office annually assigns the type and number of management activities to be evaluated on each Forest. The specific sites for each evaluated management activity are randomly selected from Forest project pools. Statistical analyses are periodically performed from the collective Regional data, and annual reports of Regionwide BMP implementation and effectiveness are presented to the State and Regional water boards.

The criteria for sample pool development are Regionally standardized by activity type and described in the BMPEP User's Guide (2002 revision). Some minor changes in the forms for E10 (road decommissioning) and G24 (grazing) resulted from field protocol testing on the Forest in 2005.

In addition to the random sample sites, projects are selected that are of management interest with regard to timely water quality protection implementation. Evaluation of non-randomly selected sites is often called "concurrent" BMP monitoring because it is accomplished while the project is actively operating. Feedback is immediate and remedial action can be taken, however, comprehensive assessment of BMP effectiveness is not possible since there has not been a post-project winter season to test the protection measures. Besides the BMPEP, contract compliance monitoring is done concurrently, and assesses BMP implementation along with other project resource protection measures.

BMP monitoring strives for an interdisciplinary evaluation of projects, and involves project proponents and watershed personnel. This interdisciplinary effort provides direct feedback to the project proponent on how well the BMP was implemented and allows for adaptive management on future project design.

Earth scientists Juan de la Fuente, Tom Laurent, Roberta Van de Water and William Snively, along with various District personnel conducted BMP evaluations in 2005.

Randomly Sampled Site Monitoring

Data collection methods are specific for each BMP and are described in the BMPEP User's Guide (USDA, Forest Service, 2002). One modification on the KNF is that BMP evaluations that require soil cover monitoring use the Forest's soil cover monitoring procedures developed by the Forest in 1998.

The data gathered are identified for each BMP and used to answer specific evaluation questions on each BMP evaluation form. Management activities (e.g. timber projects, roads, prescribed fire, tractor piling) require: 1) a prepared EA or EIS; 2) adherence to contract requirements; and 3) the passing of at least one winter (but not more than 3 winters) since contract requirements were met. In-channel construction

and snow removal BMP evaluations are exceptions to the third criterion because the evaluations (E-13 and E-17, respectively) are done during the activity or immediately after completion.

The timber, silviculture and engineering project sample pool was developed from a list of closed timber sales. Decommissioned road samples are taken from the Forestwide Decommissioned Roads Database. The prescribed fire sample pool was developed from a list of completed prescribed fire projects. The recreation sample pools included all known developed and dispersed recreation sites on the Forest. The grazing sample pool was a list of active grazing allotments on the Forest by district.

Non-Randomly Sampled Site Monitoring

Data collection was similar to that used for randomly sampled sites; however, some of the data may be more qualitative than that collected using the strict Regional protocol. Often the same forms are used, but the data are not entered into the database or numerically scored. Narrative reports are often used to present or supplement the evaluation. The primary difference from the randomly selected sites is that no significant runoff has typically occurred since project implementation because the site visit is usually done during the active phase of the project. In 2005, several road reconstruction projects (for fish passage and streamflow capacity), a snow removal project with two sites, and wet weather timber sale operations were evaluated. The snow removal site evaluations were prompted by internal staff concerns over effects from the project, the road crossing reconstruction sites were selected due to programmatic questions regarding BMP application, and the Wet Weather Operations (WWO) sites were evaluated as a condition of contract operations and agency policy.

SUMMARY BY PROJECT TYPE

Unless otherwise stated, the following results are from random sampled sites,

Timber Activities

T01 Streamside Management Zones (SMZ)

Three harvest units (8, 37 and 65) were reviewed from the Ken Del Timber Sale on the Goosenest District. The SMZ as located on the ground varied from 130 to 300 feet on either side of an intermittent stream. All of the sampled SMZs met BMP implementation and effectiveness evaluation requirements.

T02 Skid Trails

Randomly selected skid trails at 3 sites in two harvest units (32 and 52) on the Five Point Timber Sale and one site (in unit 23) in Guard Station Thin Timber Sale were evaluated. The skid trails met all evaluation criteria for BMP implementation and effectiveness. The water bar failure rate was 0%. None of the sampled skid trails crossed streams.

T03 Suspended Yarding

One suspended yarding site was evaluated on Happy Camp Fire Protection 03 Project (HCPF03), in unit 29. Waterbarring for erosion control in cable corridors was completed. There was no SMZ in the unit, so no disturbance related to yarding logs across a stream was at risk. The ground cover objective of 70% was met, and little or no evidence of rilling was found on cable corridors.

T04 Landings

Three log landings were reviewed in three project areas (Five Point Timber Sale/Unit 26, Glassups Timber Sale/Unit 192, and HCFP03/Unit 29). All met project BMP and contract requirements. This included waterbars and/or outslowing of the surface, which were observed to effectively disperse runoff based on lack of evidence for concentrated flow. On the HCFP03 landing, special EA conditions that were implemented included landing placement on the road shoulder, outslowing for drainage, limited road width, and erosion control that included placement of slash below the landing. The other two landings did not have special EA conditions required. Those landings met the standard implementation practices and were fully effective at dispersing drainage, and controlling erosion and sedimentation.

T07 Meadow Protection

One timber sale unit (23) on Guard Station Thin project was evaluated for identification on the sale area map and results of the project-prescribed equipment exclusion. Equipment was excluded from the meadow and no timber was removed from the meadow. Protection practices resulted in no disturbance to the meadow, which is located outside the unit boundary between road 43N84 and the stream. The meadow protection practices were implemented and effective.

Road Engineering Activities

E08 Road Surface, Drainage and Slope Protection (BMPs 2.2, 2.4, 2.5, 2.7, 2.10, 2.22 and 2.23)

Road maintenance was evaluated on three roads. Two roads (43N06 and 43N80) were sampled on Ken Del timber sale and one road (17N09) on Happy Camp Fuel Reduction project was evaluated. All three sites met BMP implementation and effectiveness requirements. **Road 43N80** reconstruction had minor drainage problems; however, they were noted to have caused no sedimentation as of time of visit. It was further noted that there may have been some use or maintenance of the road in 2005 (after the sale closed). Recommendations were made to correct drainage problems (i.e. through construction of a rolling dip) that stemmed from the original construction due to high throughput embankments and poor drainage design near the junction with road 43N06. It was noted that these problems did not stem from the project being evaluated. It was also noted that **43N06** was located too close to an intermittent stream in one area. Although the reconstruction being evaluated did not cause sedimentation, some erosion was caused by road surface drainage. The sediment reached the stream because the road was located (pre-project) too close to the stream. **Road 17N08** field notes said that the road was completely outslowed and in very good condition. The fillslopes were densely vegetated. One “minor puddle” was noted in a swale, but the problem occurred during the original construction, and the evaluated activities are maintenance only.

E09 Stream Crossing

Three road-stream crossing sites were evaluated: the 2 Ken Del roads evaluated under E08 plus one on 17N10 on Happy Camp Fuel Reduction project. The **43N06** site was a rip-rapped low water crossing located on June Creek at a dip in the road grade. The **43N80** site was also a low water crossing. Both sites are on intermittent stream reaches. Although the crossing was dry in mid November, there was evidence that road 43N06 diverts some water to the crossing in intense summer thunderstorms or during snowmelt. It was not causing scour; however, the recommendation was made to reshape the 43N06 roadbed to ensure that excess water would not be delivered to the crossing. Reshaping of 43N06 (see E08) could help relieve excess water at this crossing. A small ponding area was noted on 17N10, but it was not considered as threatening to fill integrity. All 3 sites met BMP implementation and effectiveness requirements for fillslope erosion and stability, culvert-related erosion potential, and road surface erosion.

E10 Road Decommissioning

One road decommissioning project on the Oak Knoll District (46N66A) was evaluated. The observer noted that implementation and effectiveness were generally good; however, upon scoring, it was determined that implementation failed because not all the fill was removed in a few stream crossings. In addition, some fill was disposed of adjacent to channels (50' away). Rills were present on some of the disposal material. Although contract specifications were met, rills were present (not extending to the channel) and minor, short-term channel adjustment is anticipated. The design may have been inadequate because it called for rocking crossings wherever culverts were to be removed, but not at other crossings (non-piped). With hindsight, some of those sites should have also received rock for erosion control, in the opinion of the observer. See the Adaptive Management Discussion under item #3. The degree of effect from these shortfalls on 46N66A decommissioning work was noted to be insignificant, and effectiveness was good overall.

E11 Control of Sidecast Material

The three road sites identified under E08 were evaluated for sidecasting standards. Two roads were on the Ken Del Timber Sale (43N06 maintenance and 43N80 reconstruction) and one was on HCFP03 (17N10, which was constructed in 2004). All sites met BMP implementation requirements to control sidecast. One observation was that little earthwork was done on 43N80, and slopes were gentle enough that sidecast was not an issue.

E13 In-Channel Construction Practices

Three in-channel construction sites on two fish passage restoration projects (one on Scott River RD and one on Happy Camp Knoll RD) were evaluated. The Scott River RD project was road **39N08** in Carter Meadows. It met all effectiveness criteria, but not all implementation requirements were met. Specifically, the project requirement for stream diversion, for a diversion plan to be in place, prior to fill removal, was not done. Effectiveness was considered fully met, because there were no discernable differences in riffle substrate upstream and downstream of the project; there was no turbidity plume persisting >20 channel-widths downstream and no construction material was left in the channel or on the floodplain post-project. Both the Stanza crossings on Happy Camp RD, on 15N06 and 15N06, met all implementation and effectiveness criteria. In fact, Lower Stanza site exceeded the criteria of excavation and/or stockpiled material storage away from channel and floodplain. At the same site, there was a

minor departure from EA requirements when the pipe being replaced separated during pipe removal phase, prior to completion of dewatering. This resulted in a discharge of 1/3 cubic yard of fill (out of a total 5000 CY being removed) into the stream. The associated turbidity extended for 50-65 yards downstream across half the width of the channel, for a duration of 20 minutes. Background turbidity, suspended sediment, and bedload levels in the East Fork of the South Fork of the Salmon River (for the Carter Meadows site) and Elk Creek (for the Stanza projects) are relatively high, so the additional material (less than 1 cubic yard on Lower Stanza) is not likely to be measurable.

E14 Temporary Road Construction

One temporary road that accessed a unit (#8) within the Ken Del Timber Sale was evaluated. No channel was crossed. All project implementation and effectiveness requirements were met. The observer commented that it would be almost impossible to accomplish road closure/obliteration after use due to the ground being so flat.

E16 Water Source Development

Two water drafting sites on Antelope Creek in the Ken Del Timber Sale were evaluated. One was a small shallow pool at a stream ford, and the other was the main flow that was deeper than the first site. Both sites met all implementation and evaluation criteria.

E17 Snow Removal

Snow removal activities were assessed on one road each on three timber sales: Garner Blowdown Salvage (44N01/Road 77); Antelope Piles Chip Timber Sale (43N13); and Trail Creek Campground Timber Sale (campground loop road). The first two are on Goosenest District, and the third is on Scott River District. All requirements for implementation and effectiveness were met at all three roads.

E 20 Management of Roads During Wet Periods

Jack Heli was the only project using roads during wet periods, except for eastside Forest timber sales. See the discussion on page 9 regarding these projects. One BMPEP site visit was made to Jack Helicopter Timber Sale on Scott River District, following the close of the Normal Operating Period. This non-random sample looked at a portion of the main road (40N17) and a landing along with its short access road off the main road. Haul had been discontinued shortly before the visit. Under “implementation; Forest wet weather operations standards followed”, the rating was “Not Applicable” because the timber sale contract predated the Forest WWO policy. Some roads on the sale had required site-specific WWO mitigations, but the main road did not. Regarding the effectiveness evaluation, some rutting was present on the roads, but was on <10% of the road length, and other criteria were fully met, therefore the BMP was effective overall. The landing had no evidence of sediment traveling more than 10’ beyond the toe of the fillslope. The landing slope toe was located approximately 200’ from the stream on fairly flat ground. See the Summary of Non-Random Evaluations, WWO discussion for more information.

Recreation Activities

R22 Developed Recreation Sites

One developed recreation site, Curley Jack Campground on Happy Camp District, was evaluated. It passed both implementation and effectiveness criteria. There was a minor departure under the implementation, “sanitation facilities” criteria because one toilet is within 100’ of high water. It is quite possible that the river moved closer to the toilet since its original construction. The “runoff, impervious surfaces” criteria was exceeded because the loop road is paved, because gravel surfacing would have met basic water quality protection needs.

R30 Dispersed Recreation Sites

Two dispersed recreation sites were visited: Eddy Gulch Lookout picnic area on Salmon River District, and Ash Creek River Access on Oak Knoll District. Both sites passed implementation and effectiveness, although the Ash Creek site had “minor departures” for the two criteria: SMZ protection and “problems addressed through management action (physical barriers, and so on)”. The timing of the visit was February 2006, soon after several high flow events. The main problem was deep ruts below a seep that appears in the middle of the access turnaround. There is flood related damage that is secondary, and this was later repaired. However, the recommended corrective actions (placement of surface rock and, at a minimum, signing to prevent further rutting) need to be taken.

Range Management Activities

G24 Range Management

One range allotment on Scott River District, Shackleford Allotment, was evaluated. All implementation criteria were met, except that site specific standards and guidelines pertaining to streambank disturbance have not been developed and incorporated into the annual operating plan, grazing permit, or allotment management plan as of the site visit (10/25/05). Of the 9 effectiveness criteria, 7 were met in the highly effective category, and two were met in the moderately effective category. These were bank stability and lentic habitat disturbance (seeps, springs and ponds). For bank stability, the sampled channel reach is 70-80% stable (high is >80%). For lentic habitat, <10% was disturbed by livestock hoof prints, trails, or rilling. A high rating would be “little or no evidence” of such disturbance. The site passed implementation, overall, but failed effectiveness upon scoring. This was likely due to problems with the scoring rather than BMP failure. See the Adaptive Management discussion, under item #3.

Fire Management Activities

F25 Prescribed Fire

Six prescribed burn units were monitored on the Scott River District (Canon/Cub TS unit 93), (Canon/Kelsey underburn project in Canyon Creek), on Goosenest District (Kelly Pass Timber Sale units 1, 2 and 6) and on Salmon River District (Taylor Fuels Reduction Project unit 26). These burn units met all BMP requirements for implementation and effectiveness. Effectiveness criteria include an upslope evaluation (soil cover, etc.), an SMZ evaluation, and whether there is sediment near or into the channel.

Minerals Management Activities

M27 Common Variety Minerals

One rock pit site was evaluated, and it was fully implemented and effective. The rock pit, located on Salmon River RD, was used for Gronchi Road Stormproofing and Sign Creek Fish Passage projects.

Vegetation Management Activities

V28 Vegetation Manipulation

Four sites, two mastication and two tractor-piling units, were evaluated. The mastication units were on Goosenest and Salmon River Districts, and the piling units were on Goosenest District. All sites were successfully implemented and effective.

V29 Revegetation of Surface Disturbed Areas

Two road decommissioning projects on Salmon River District had sites assessed for success of revegetation (seeding and mulching on an outslowed prism). Both sites were fully implemented and effective.

SUMMARY OF NON-RANDOM SITE EVALUATIONS

Wet Weather Operations

Jack Heli Timber Sale – This was the only project operating on the west side of the Forest after the Normal Operating Period. The winter 2005 east side timber sales were monitored for wet weather operations, but the resource concerns were largely for road and soil resources. There were few concerns with those sales for water quality because most operations are conducted when snow is protecting the road surface and there are negligible water quality risks. Results of soil compaction and permeability evaluations of skid trails have been reported elsewhere and are available in KNF Supervisor's Office files.

In addition to the BMPEP monitoring in the previous discussion, three timber sale administrators regularly inspected roads and landing for contract consistency on Jack Heli T.S. from early November through late January. Operations were shut down for the season in late January, and there were additional operation suspension periods during this time, due to weather. A BMP-WWO seasonal report and contract daily diaries were used to document weather and resource conditions, sale activity status, and any site specific BMPs prescribed to protect resources during operations. Some of the prescribed remedies were: notifying the contractor of suspension of all operations due to wet conditions; termination of log haul in case of melting snow or heavy rain; waterbarring of a landing access road; flagging/avoidance of spring areas in roadbed; diverting springflow into inside ditch; placement of road surface rock; repair of running surface; placement of filter cloth for sediment catchment structures and at dip outlets; and retaining at least 2" of snow on plowed road surface. Notes in at least 14 daily diary entries in the contract folder documented these.

Forestwide Fish Passage Projects

Monitoring took place during construction and immediately afterward, at seven projects in November 2005, in coordination with a Regional study using in-channel metrics to assess BMP effectiveness. Upslope evaluations were conducted for various road engineering BMPs to determine if implementation was accomplished. These were

- Deer/Grouse (on Oak Knoll District),
- Upper and lower Stanza on Stanza/Bishop Project (Happy Camp District),
- Upper Elk, (Happy Camp District), Upper Boulder and Lower Boulder (Scott River District) and
- Taylor Creek (Salmon River District).

The following BMPs examined are the ones required in the project plan (BMPs are not lumped into a BMPEP protocol):

- 2.2 (Erosion Control Plan),
- 2.3 (Timing of Construction Activities),
- 2.4 (Stabilization of Road Slopes and Spoil Disposal Areas),
- 2.6 (Dispersion of Subsurface Drainage from Cut and Fill Slopes),
- 2.7 (Control of Road Drainage),
- 2.10 (Construction of Stable Embankments),
- 2.11 (Control of Sidecast Material),
- 2.12 (Servicing and Refueling of Equipment),
- 2.13 (Control of Construction in SMZs),
- 2.15 (Diversion of Flows around Construction Sites),
- 2.17 (Bridge and Culvert Installation),
- 2.20 (Specify Riprap Composition),
- 2.22 Maintenance of Road Surface Treatment to Prevent Loss of Materials),
- 2.24 (Traffic Control During Wet Periods), and
- 2.27 (Restoration of Borrow Pits and Quarries).

Most implementation requirements were met and considered effective per upslope criteria. The exceptions are as follows: a) BMP 2.7 for the Taylor Creek Project, BMP was not fully implemented nor effective resulting in gullying, even though the contractor placed riprap at the vulnerable point; b) BMP 2.10 for Taylor Creek was not fully implemented, nor effective, with fill settling on the roadway over the crossing indicating that compaction specs may not have been met; c) BMP 2.10 on Deer Grouse was not fully effective even though fully implemented, because there is some evidence of fill settling; and d) BMP 2.15 at Stanza/Bishop was not fully implemented or effective because of pipe separation prior to dewatering taking place (also an E-13 BMPEP random site, discussed in that section). Full dewatering would have required constant pumping and construction of a coffer dam, which were deemed as not reasonable or prudent.

The evaluator noted that “a recurrent and chronic problem with sediment mobilization on all the projects occurred when the channels were rewatered after dewatering had taken place in compliance with BMP 2.15” as required by the fish passage EA’s. The evaluator’s recommendation was to place semi-permeable fabric on the channel bottom, and then place Class III to Class V riprap over the fabric. This

is further discussed under Adaptive Management. Detailed results for each BMP can be found in a November 15, 2006 report by hydrologist William Snavely, titled “Fish Passage BMP Effectiveness Report”, on file in the KNF Supervisor’s Office.

Snow Removal

Two non-random evaluations were done on the Salmon River District. The sites were Cecil Creek Road (38N27) and the Eddy Gulch Lookout Road (39N53). These were surveyed on 5/26 and 5/27 by an interdisciplinary teams of hydrologists, road engineers and a fisheries biologist. Concerns had been raised by road engineers that facility and perhaps water resource damage had occurred due to snow plowing by an inexperienced equipment operator. The Eddy Gulch Lookout Road had negligible damage, while the Cecil Ck. road did not meet either implementation or effectiveness standards for BMP 2.25 for snow removal. Under implementation, the evaluators noted a major departure from forest snow removal standards for leaving 2” of snow, and not pushing up berms. Under effectiveness, although there was evidence of scour from concentrated snowmelt, it was on less than 10% of the road length. There was also evidence of sediment reaching one small headwater channel, with the degree noted as “insignificant to minor” in duration, degree and extent. The District remedied the situation through grading later in the season, and more closely following the equipment training and certification policies. Photos and further detail are given in memos from Sharon Koorda to Ray Haupt dated 3/25/06, and from Roberta Van de Water to Ray Haupt and Jack West, dated 3/27/06, on file in the Supervisor’s Office.

RESULTS SUMMARY

Overall, 94% of the evaluated sites met all BMP implementation and effectiveness requirements. An additional 4% were effective, even though not fully implemented, and another 2% were implemented, but not considered fully effective. None of the sites sampled were rated as not implemented/not effective. This maintains the level of BMP implementation and effectiveness achieved in 2004. The few problem areas were associated with a decommissioned road, an in-channel construction project, a grazing site, and a river access site. There was no evidence of past or present water quality impairment from noncompliance sites. The inchannel construction site was fully remedied and the river access site was partially remedied. The grazing BMP problem is apparently due to a data management glitch. Considerations are given in the Adaptive Management section, including Forest-level adoption of streambank alteration standards and guidelines for grazing, and review of road decommissioning practices at stream crossings and inchannel construction practices.

Table 2. Summary of 2005 BMP Implementation and Effectiveness Success Rate by Individual BMPs. (Randomly sampled sites)

BMP	Total # of Sites	IMPLEMENTATION		EFFECTIVENESS	
		# of Sites Meeting BMP Criteria	% of Total	# of Sites Meeting BMP Criteria	% of Total
T01	3	3	100	3	100
T02	3	3	100	3	100
T03	1	1	100	1	100
T04	3	3	100	3	100
T07	1	1	100	1	100
E08	3	3	100	3	100
E09	3	3	100	3	100
E10	1	0	0	1	100
E11	3	3	100	3	100
E13	3	2	66.7	3	100
E14	1	1	100	1	100
E16	2	2	100	2	100
E17	3	3	100	3	100
E20	1	1	100	1	100
R22	1	1	100	1	100
R30	2	2	100	2	100
G24	1	1	100	0	0
F25	6	6	100	6	100
M27	1	1	100	1	100
V28	4	4	100	4	100
V29	2	2	100	2	100

ADAPTIVE MANAGEMENT DISCUSSION AND CONSIDERATIONS

The following discussion is divided into 1) practices that are working well, 2) practice application that can be improved, 3) practices to consider for Forest modifications, and 4) BMPEP protocols and databases that need reconsideration/repair.

1. Practices that are working well

Most of the two dozen activities evaluated in 2005 met BMP compliance and were effective at controlling nonpoint pollution. These included all timber sale activities; all vegetation, fire and minerals management activities; and most road engineering and recreation management activities. Management should encourage use of these practices on all future projects.

2. Practice applications that can be improved

The 2005 project BMPs were effective; however, implementation could be improved as follows:

a. E10 Road Decommissioning

The 2005 evaluation of this practice indicated that the distance of fill material disposal piles and stream channels needs to be clearly specified in the contract. This distance should be adequate to ensure future weather events do not result in material moving into a channel.

Forest policy specifies that all fill material should be removed from stream crossing sites.

b. E13 Inchannel Construction

Minor implementation problems were observed at some of the in-channel construction sites (E13). Planning and implementation of in-channel construction can benefit from anticipation of potential problems throughout the project. One problem with sediment mobilization on the fish passage projects was mentioned under the non-random site discussion. The recommended improvement is to continue requiring dewatering of the channel, but once the channel is dewatered, semi-permeable fabric should be placed on the channel bottom. Then Class III to Class V riprap (depending on the stream power) should be placed over the fabric, for the length of the fabric.

Excavation through alluvium to bedrock, and placement of riprap along the stemwall and the edge of the stream under the arch structure may reduce the probability of sediment mobilization and structure jeopardy.

Any verbal agreements made to determine how to best meet erosion control needs and dewater the channel should be documented because a formalized plan is easier to administer and to evaluate for BMP compliance.

A Forest-level workshop involving interdisciplinary planning and implementation specialists would help to refine the inchannel construction practice. A similar workshop, held in April 2004, identified and

corrected common problems. Other refinements to inchannel practices offered in item #3 could also be discussed during the workshop.

c. R30 Dispersed Recreation

Because of their streamside location, river access sites are vulnerable to changes from flooding and can pose a risk of sediment discharge. The sampled river access site had deep ruts in the turnaround, mainly due to its location the outlet of a small spring-fed stream, with no drainage allowance or road surface protection. Many of the Forest's river access sites were inventoried in 2006 to assess flood damage emergency repair needs. A follow-up inventory by an interdisciplinary team of an earth scientist and/or engineer, and a recreational specialist should evaluate long term public access and resource protection needs at all river access sites.

3. Practices to consider for possible modification at the Forest level

a. E 10 Road Decommissioning

Forestwide criteria for use of riprap in road decommissioning projects should be developed by an interdisciplinary team composed of earth scientist, fish biologist, and engineer. A post-2006 flood review of decommissioned crossings may provide information to improve decommissioning design.

b. E 13 Inchannel Construction

In several 2005 fish passage projects, the decision document called for full dewatering during the entire construction period, which was estimated to last no more than 2 weeks. Neither the time period, nor the cost of complete dewatering, were realistic. The challenges of dewatering prior to construction should be examined at the Forest level, possibly in a workshop format. Planned projects should be feasible and incorporate site-appropriate BMPs. Project implementation should result in meeting planned objectives which have been incorporated into the contract from approved project plans. Contract plans should be reviewed by appropriate specialists prior to finalization

c. G24 Grazing

Range management situations encountered in 2005 included localized trampling of meadows and streambank areas with probable short-term effects. Range sites met the BMP implementation criteria, but did not pass effectiveness. The Forest should develop specific water quality/riparian standard and guidelines to meet the evaluation protocol expectations.

Forest range staff began to formulate streambank disturbance and woody plant utilization objectives in 2002, but never completed this effort. A Forest Plan revision that incorporates streambank disturbance levels in grazing standards and guidelines is currently being reviewed by range management and Forest planning staff.

4. Evaluation protocol and database functional glitches for Regional level reconsideration and repair

a. G-24 Grazing

There are unresolved problems with the evaluation protocol and its scoring methodology. The 2002 evaluation protocol that was used requires measuring specific stream bank disturbance and woody plant utilization against Forest Plan or Annual Operating Plan (AOP) objectives for implementation success. The effectiveness scoring is automated so that any item not met at its highest level causes the entire site to fail, including one with a single moderate rating. This feature is inconsistent with other BMPEP protocols.

CONCLUSIONS

The majority of practices evaluated in 2005 are highly successful, as a result of management commitment and the training and experience of project planners and implementers. This needs to be encouraged in order to continue the Forest's BMP successes.

Appendix A. BMP Evaluation Procedure Names and Descriptions.

<i>Procedure #</i>	<i>Procedure Name (BMPs Monitored)</i>
T01	Streamside Management Zones* (BMP 1.8, 1.19, 1.22)
T02	Skid trails (BMP 1.10, 1.17)
T03	Suspended yarding (BMP 1.11)
T04	Landings (BMP 1.12, 1.16)
T05	Timber sale administration (BMP 1.13, 1.20, 1.25)
T06	Special erosion control and revegetation (BMP 1.14, 1.15)
T07	Meadow protection (BMP 1.18, 1.22, 5.3)
E08	Road surface, drainage and slope protection (BMP 2.2, 4, 5, 10, 23)
E09	Stream crossings (BMP 2.1)
E10	Road Decommissioning (BMP 2.26)
E11	Control of side cast material (BMP 2.11)
E12	Servicing and refueling (BMP 2.12)
E13	In-channel construction practices (BMP 2.14, 2.15, 2.17)
E14	Temporary roads (BMP 2.16, 2.26)
E15	Rip rap composition (BMP 2.20)
E16	Water source development (BMP 2.21)
E17	Snow removal (BMP 2.25)
E18	Pioneer road construction (BMP 2.3, 2.8, 2.9, 2.19)
E19	Restoration of borrow pits and quarries (BMP 2.27, 2.18)
E20	Management of roads during wet periods (BMP 2.24, 7.7)
R22	Developed recreation sites (BMP 4.3, 4, 5, 6, 9, 10)
R23	Location of stock facilities in wilderness (BMP 4.11)
G24	Range management (BMP 8.1, 8.2, 8.3)
F25	Prescribed fire (BMP 6.3)
M26	Mining operations (Locatable minerals) (BMP 3.1, 3.2)
M27	Common variety minerals (BMP 3.3)
V28	Vegetation manipulation (BMP 5.1, 5.2, 5.5, 5.7)
V29	Revegetation of surface disturbed areas (BMP 5.4)
R30	Dispersed Recreation Sites (BMP 4.5, 4.6, 4.10)